REMARKS

Claims 1-6 are pending in this application. Claim 7 was cancelled without prejudice in Applicants' previous Amendment of May 24, 2004. Claims 2-3 and 5-6 are presently cancelled without prejudice. Applicants reserve the right to file a divisional application to the cancelled claims. Claims 1 and 4 have been amended as above to clarify the mode of applying hot air current to the dry starch grain material.

35 U.S.C. § 103(a) Rejections

Claims 1-6 stand rejected under 35 U.S.C. § 103(a) for asserted obviousness over JP 09-294579 to Shimotori et al. (hereinafter "'579 patent"). As discussed above, claims 2-3 and 5-6 have been cancelled. The Applicants trust that the presently filed amendments render the subject matter of claims 1 and 4 distinct over the '579 patent, thus overcoming the obviousness rejections.

Independent claims 1 and 4 of the present application have been modified by the foregoing Amendment. Specifically, both independent claims, as amended, are further limited in that the starch grain material obtained from the microwave irradiating step is used directly as sake-brewing rice without first being subjected to any of a water-soaking step, steaming step, liquefying step or roasting step. This is in stark contrast to the '579 patent, wherein, at the bottom of page 5 of 8 of the computer generated English translation, [0031], the '579 patent discloses that the raw material was made to absorb water to 30% (w/w) of water content before the microwave processing and torrefaction steps. Additionally, at page 2 of 8 of the translation of the '579 patent, [0009], it is disclosed that the raw material is preferably at 15 to 50% (w/w), although the water content is especially chosen in the 20 to 40% (w/w) range prior to the microwave processing and torrefaction steps. Hence, it is understood that the '579 patent explicitly recognizes that causing the raw material to absorb water is the preferred invention.

Further, in this reference, although it is described that after the microwave/roasting step, the material can be used directly as the sake-brewing material in the subsequent fermenting step, it is also described that the soaking/cooking/liquefying treatment is affected. For instance, as discussed above, Example 1 at paragraph [0031] on page 5 of 8 of the computer generated translation refers to soaking of the material. Thus, it is understood that affecting the soaking/cooking/liquefying treatment is recognized as a preferred condition.

As can be seen more clearly in the certified English translation of paragraphs [0010] through [0012], which is provided for the Examiner's convenience, in the case of the '579 patent, the starch material is subjected to the water absorbing step and the microwave irradiating/roasting step, so that the starch may become "sticky (α)" to improve solubility. This material is used as the brewing (steamed) rice material to be subjected to the subsequent soaking/cooking/liquefying treatment, thus achieving the effect of improved solubility of starch. Thus, it is believed that the cited reference requires the starch solubility improvement process for the invention to work.

In contrast to the '579 patent, the present invention according to the amended claims differs in that the invention employs the starch material under its dry condition prior to the microwave irradiating/hot air blowing step, hence, not affecting any water absorbing step with the material. The present invention also differs in that this does not affect the soaking/cooking/liquefying treatment.

That is to say, the present invention entirely lacks the technical concept of affecting water absorption/soaking of starch material after the microwave/hot air step. Therefore, the present invention employs a technique which does not enhance the solubility of starch material. Additionally, the present invention provides the unique effect of achieving enhanced fermentation efficiency, even in the case of low solubility (low digestion degree) of the raw starch material. Please see Example 3 of the present specification. Such an effect could not have been expected from the '579 patent, which affects the starch solubility-improving step described above.

In short, the presently claimed invention proposes a method of fermenting raw starch or low-digestive starch with high fermentation efficiency. Such raw starch or low-digestive starch can be used as fermentation material having a superior shelf life. Whereas, the starch material with the enhanced solubility of the '579 patent has poor shelf life, which presents a problem in the course of market distribution, such as sales.

Moreover, the method of the present invention can use a variety of wild type yeast and koji mold which are generally unsuitable for use in highly digestive starch material. Hence, the presently claimed invention is superior in its applicability to a greater variety of yeast and koji mold. In general, it is known that various yeasts provide unique and different flavors and tastes in the products fermented therewith. Therefore, the method of the present invention is superior also in that this can add various flavors and tastes to products through selective use of various yeasts and koji molds.

To further demonstrate the differences between the present invention and the invention of the '579 patent, it is important to discuss the components of Japanese sake processed through the fermentation step in detail.

The "Japanese sake degree" is a numerical representation of saccharine content contained in sake as determined by a hydrometer specially made therefor, the degree being indicated with a "+" or "-" sign. For instance, a value with a + sign indicates a lower saccharine content, thus "dry" sake. In the case of the present invention, the sake has a Japanese sake degree ranging from 22 to 25 (see Table 6 at page 21 of the present application), whereas the sake made by the method of the cited reference has the Japanese sake degree of -0.5 (see the certified English translation of Table 6 of the cited reference provided for the convenience of the Examiner).

The "amino acid degree" concerns the property of the sake ingredient relating to taste and "body" (being e.g., full-bodied or light-bodied). In the case of the present invention, with progress of the fermentation process, the amino acid degree increases from 0.3 at day 2 to 2.7 at day 15 (see Table 6 of the present application). Whereas, in the case of the '579 patent, total nitrogen (amino acid degree) decreases from 114 to 41 (again, please see the certified translation of Table 6 of the '579 patent).

That is to say, it should be understood that the present invention totally differs from the invention of the cited patent in terms of the variations occurring in the taste or flavor determinant important factors in the sake brewing process, such as "Japanese sake degree" and "amino acid degree".

From the above description, it should be apparent that the method of processing starch grain as proposed in the presently amended claims is totally different and superior to the method of the cited reference and that the former (present invention's method) allows for the manufacture of sake having a unique flavor unlike that of the sake made by the '579 patent.

Consequently, the present invention according to the presently amended claims achieves effects which cannot have been expected from the disclosure of the cited reference. Thus, Applicants trust that the claims of the present invention should be viewed as allowable over the '579 patent.

Further, the '579 patent "teaches away" from the present invention because the cited reference strongly emphasizes the need to soak the starch grain material before further processing. It is a well-known tenet of patent law that "a *prima facie* case of obviousness can

be rebutted if the applicant...can show that the art in any material respect taught away from the claimed invention." In re Geisler, 116 F.3d 1465, 1469 (Fed. Cir. 1997) (quoting In re Malagari, 499 F.2d 1297, 1303 (CCPA 1974)). Further, "[a] reference may be said to teach away when a person of ordinary skill, upon reading the reference...would be led in a direction divergent from the path that was taken by the applicant." Tec Air, Inc. v. Denso Mfg. Mich. Inc., 192 F.3d 1353, 1360 (Fed. Cir. 1999). Such is the case here. Applicants have a strong argument in that one recreating the methods of the '579 patent would soak the starch grain material before further processing. Thus, the '579 patent does not render obvious the methods of the presently claimed invention because it expressly "teaches away" from using the starch grain material in a dry state.

For all the foregoing reasons and in view of the presently-submitted claim amendments, Applicants believe that claims 1 and 4 are patentable and non-obvious over the cited prior art and in condition for allowance. Reconsideration of the rejections and allowance of pending claims 1 and 4 are respectfully requested.

Respectfully submitted,

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CERTIFICATION

I, Takatoshi KOBAYASHI, translator of S. KITAMURA PATENT OFFICE of 5-8-1, Toyosaki, Kita-ku, Osaka, Japan, hereby certify that I am conversant with the English and Japanese languages and am a competent translator thereof. I further certify that to the best of my knowledge and belief the following is a true and correct translation made by me of the documents in the Japanese language attached hereto.

Signed this 15th day of November 2004

T. Kobayashi

Takatoshi KOBAYASHI

Japanese Patent Application "Kokai" No. 9-294579

English translation of paragraphs [0010] through [0012] and Table 6

[0010] For processing the sake-brewing material and/or "koji" material, the microwave treatment and the roasting treatment may be carried out simultaneously. Or, the microwave treatment may be carried out first, then followed by the roasting treatment or the roasting treatment may be carried out first, then followed by the microwave treatment. If the microwave treatment alone is employed, this will require a significant amount of electric energy, thus being economically disadvantageous. Hence, in actual implementation, the microwave treatment and the roasting treatment will be employed in combination, with appropriate setting of conditions respectively therefor. The conditions of the microwave treatment to the sake-brewing material and/or "koji" material will be appropriately selected, depending on the kind, form and water content of the material to be treated. The frequency ranges preferably from 300 MHz to 300 GHz, especially preferably from 1 GHz to 30 GHz. The treatment time period will be suitably selected as ranging from a few seconds to a few hours, especially preferably from a few tens of seconds to a few tends of minutes. The treatment temperature ranges preferably from 70 to 400℃, especially preferably from 100 to 300℃. The conditions of the roasting treatment to the sake-brewing material and/or "koji" material will be appropriately selected, depending on the kind, form and water content of the material to be treated. The treatment temperature ranges preferably from 70 to 400℃, especially preferably from 100 to 300℃. The treatment time period will be suitably selected as ranging from a few seconds to a few hours, especially preferably from a few tens of seconds to a few tends of minutes. By effecting the microwave treatment and the roasting treatment (to be briefly referred to as "microwave/roasting treatment"

hereinafter), there can be obtained a microwave/roasting treated product with increase in α-structure conversion degree of starch and enzyme non-digestibility of protein.

[0011] As the material, e.g. the sake-brewing material and/or "koji" material, to be treated in the microwave/roasting treatment, such material can be used ① as it is directly, ② with absorption of water therein, ③ after being soaked in water and then drained off water or ④ after being soaked in water, then drained off water and then being cooked. As the sake-brewing material, there are obtained the effects of improved starch solubility relating to the α-structure conversion degree thereof and reduced enzyme digestibility of the protein. As the "koji" material, hypha can readily permeate to the inner side of the material; hence, there is obtained "koji" with a strong chestnut-like flavor, which is a good flavor, with increased biomass amount per unit amount of material. In addition, enzyme generation of the Aspergillus oryzae is improved also.

[0012] The manufacture of the liquor product or food product with using the resultant microwave/roasting treated material is effected by the standard method. If saccharization/brewing of the material is effected by using the "koji" material, an exogenous enzyme of animal, plant or microorganism origin can be employed additionally. Further, when processing the raw material, such exogenous enzyme of animal, plant or microorganism origin can be employed also. Incidentally, the saccharization as used in the present invention includes liquefaction. The apparatus for use in the saccharization can be a batch-processing type apparatus or a continuous-processing type apparatus. The exogenous enzyme for use in the manufacture of the liquor or food product includes liquefying exogenous enzymes and/or saccharizing exogenous enzymes. The liquefying exogenous enzymes usable include mesophilic type such as "SPITAZE CP-3 (manufactured by Nogase Biochemical Industry Co., Ltd.), "KOKUGEN" (manufactured by Yamato Chemical Industry Co., Ltd.),

"KLEISTAZE" (manufactured by Yamato Chemical Industry Co., Ltd), "α -AMIRAZE-800" (manufactured by Ueda Chemical Industry Co., Ltd.) as well as thermophilic type such as "SPITAZE HS" (manufactured by Nogase Biochemical Industry Co., Ltd.), "TERMAMIL" (manufactured by Novo Co., Ltd.), "KLEISTAZE TS" (manufactured by Yamato Chemical Industry Co., Ltd), "KOKUGEN T20M" (manufactured by Yamato Chemical Industry Co., Ltd.). The saccharizing exogenous enzymes usable include "SUN-SUPER" (manufactured by Novo Co., Ltd.), "SUMICHIMU-L" (manufactured by Shin-Nihon Kagaku-kogyo"), "UNIAZE-K" (manufactured by Yakult Co., Ltd.), "DABIAZE K-27 (manufactured by Nogase Biochemical Industry Co., Ltd.), "TAKARACHIUM-PLS" (manufactured by Nogase Biochemical Industry Co., Ltd.). etc. As other exogenous enzymes, a protease agent, a lipase agent, a cellulase agent, a hemicellulase agent may be employed.

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Table 6 analytical values of ingredients and organoleptic test results

	microwave/roasting treated rice	roasted rice	normal steamed rice
Japanese sake degree	-0.5	+0.7	±0
alcohol (%, v/v)	16.6	16.6	16.3
acidity (0.1N NaOH ml/10ml)	1.4	1.6	1.6
total nitrogen (mg%, w/v)	41	50	114
pH	4.0	4.0	4.1
organoleptic test	1.6	1.9	2.0

note: organoleptic test evaluation method:

1: good 2: average 3: poor

panelists: 10 persons